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HOW BIG ARE THE CORN AND SOYBEAN CROPS NOW?

Corn and soybean prices continue to move higher in anticipation of yield reductions due to adverse weather conditions in the U.S. Soybean prices are also being supported by indications that acreage in the U.S. fell short of March intentions, by crop concerns in China and India, and by a rapid rate of consumption of the 2004 crop. Corn price strength has been much more modest than the increase in soybean prices due to large current stocks and indications that U.S. acreage exceeded March intentions.

As prices move higher, it is useful to try to estimate the U.S. crop size that is reflected by current prices. Obviously, a precise estimate cannot be made because other factors are influencing price. In addition, the relationship between crop size, consumption, and price varies over time. Still, prospective crop size is a useful question to pursue.

As a starting point, USDA's current projection of the level of stocks at the beginning of the 2005-06 marketing year and the magnitude of consumption during the 2005-06 marketing year can be used. The current average farm price of corn and soybeans during the 2005-06 marketing year as reflected by the futures market can be calculated based on a forecast of average basis and the monthly distribution of farmer marketings during the 2005-06 marketing year. Here, the three year average monthly basis and the five year average of monthly marketings (as a percentage of the total for the year) are used to make the calculation. Using that process, the futures settlement price from overnight trade on June 20 reflected an average 2005-06 marketing year farm price of \$2.40 for corn and \$7.20 for soybeans.

Given the USDA projections of beginning stocks and use and the current forecast of the average marketing year price, the only missing factor is crop size. Based on the historical relationship, an estimate of the year ending stocks to use ratio implied by current prices can be calculated. The difficulty, as described in previous reports, is that the relationship between price and stocks appears to have shifted over time. For both corn and soybeans the "fit" between stocks and price was quite strong from 1989-90 through 1997-98, but a downward shift seemed to have occurred during the period 1998-99 through 2003-04 such that a given level of stocks-to-use was associated with a much lower price during the latter period. Which of those time periods, if either, is appropriate for forecasting the relationship in 2005-06? For now, we favor using the relationship during the earlier period, because that relationship more closely reflects the stocks and price situation being

experienced during the current marketing year, particularly for soybeans.

The average farm price of soybeans reflected by the current futures market (\$7.20) implies a 2005-06 marketing year ending stocks to use ratio of 5.8 percent. Given the USDA's projection of use of 2.964 billion bushels, the ratio implies ending stocks of 172 million bushels, 83 million less than projected by USDA and implying a crop size of 2.812 billion bushels. If harvested acreage of soybeans is near 72 million, rather than the 72.6 million suggested by the March *Prospective Plantings* report, the market is trading an average yield of about 39 bushels per acre, compared to the trend yield of 39.9 bushels. Since year ending stocks cannot realistically be smaller than about 4 percent of use, a crop smaller than 2.765 billion bushels (38.4 bushels) would require consumption to be smaller than projected by the USDA. The need to ration use can result in sharply higher prices, at least for a period of time.

The average farm price of corn reflected by the current futures market (\$2.40) implies a 2005-06 marketing year ending stocks to use ratio of 13.5 percent, or 1.44 billion bushels if consumption is near the 10.67 billion bushels projected by the USDA. That level of stocks is 1.1 billion bushels smaller than the current USDA projection, implying a crop of 9.885 billion bushels. If harvested acreage is near 75 million, rather than the 74.2 million suggested by the March *Prospective Plantings* report, the market is trading an average yield of 132 bushels per acre, compared to a trend yield of 145 bushels.

Based on the historic relationship between the last USDA crop condition report of the season and the average yield, the percent of the crop rated good or excellent that points to a soybean yield of 39 bushels and a corn yield of 132 bushels can be calculated. The calculation is 53 percent good or excellent for soybeans and 48 percent good or excellent for corn. Current ratings are well above those levels.

The price and yield exercise described here has a number of shortcomings, but might be helpful in judging when to price new crop corn and soybeans.

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